

Delphi Multec[®] GDi Multi-Hole Fuel Injectors

The Delphi Multec[®] GDi Multi-Hole Fuel Injectors are designed for homogeneous combustion gasoline direct injection engine applications. This family of flexible packaging and performance-optimized injectors features an inwardly opening valve group and a multi-hole spray generator. The Multec 10 GDi Injector is capable of high pressure, up to 200 bar nominal system pressure with maximum 230 bar. The Multec 12 GDi Injector is capable of 200 bar nominal pressure with maximum pressure of 260 bar.



Delphi Multec[®] GDi Multi-Hole Fuel Injector

► Benefits

- Moving mass emits 1 dB lower acoustic noise than the rest of the industry
- Excellent fuel deposit robustness
- Valve group provides PZEV-capable fuel seal
- Flexible spray pattern with low penetration reduces fuel impingement on cylinder walls and allows flexible mounting
- Corrosion resistance, flow performance, and linear range to accommodate the requirements of ethanol-blended fuels
- Magnetic circuit is compatible with 50 V to 65 V boost voltage
- Decoupled armature allows up to 260 bar operating pressure with minimal driver energy
- Faster response times allow smaller injection quantity and greater working flow range
- Can operate with dwell times as low as 0.5 msec during multi-injection operation for Euro 6 particulate emissions number

► Typical Applications

Delphi Multec GDi Multi-Hole Fuel Injectors can be applied to any size gasoline engine, from small displacement turbo-charged engines to large displacement engines, including central mount applications. The small particles in the spray allow optimum charge distribution for reduced emissions on cold start and for future combustion processes such as gasoline homogeneous charge compression ignition (HCCI).

► Targeted Performance Specifications

	Multec 10 Injector	Multec 12 Injector
Static flow rate	Up to 20 g/sec	Up to 20 g/sec
Closing response time	0.4 msec	0.4 msec
Opening response time	0.4 msec	0.4 msec
Fuel pressure	30 to 230 bar	30 to 260 bar
Minimum linear flow (at 12.5 g/sec static flow rate)	3.0 mg/pulse	3.0 mg/pulse
D ₃₂ sauter mean diameter (SMD)	12 µm (at 100 bar)	7 µm (at 200 bar)
DV ₉₀	25 µm (at 100 bar)	16 µm (at 200 bar)
0 after inject (no bounce)	No bounce at close	No bounce at close
Cone angle as required by combustion	40° to 90°	40° to 90°

▶ **Performance Advantages**

Delphi Multec GDi Multi-Hole Fuel Injectors offer flexible spray preparation options that allow customization of the spray shape to accommodate a wide variety of combustion chamber shapes. The small particle size provides rapid vaporization for good mixture preparation. An optimized magnetic circuit provides rapid and consistent response times and increased linear flow while using industry standard drive. The injector tip is designed for fuel deposit robustness (reference SAE 2009-01-1495: Engine Test for Accelerated Fuel Deposit Formation on Injectors Used in Gasoline Direct Injection Engines). Delphi Multec GDi Multi-Hole Fuel Injectors are also designed to reduce acoustic noise.

▶ **The Delphi Advantage**

Delphi offers the benefits of vast experience producing hundreds of millions of gasoline fuel injectors for customers around the world. That experience has led to product and manufacturing process improvements which have helped eliminate contamination-related failures and provided other quality and cost advantages. Delphi's in-depth knowledge of systems and the combustion process help optimize injector performance.

As a global leader in engine management systems technology, Delphi can help manufacturers meet emissions requirements, improve fuel economy and enhance performance. Delphi is a source for high value solutions and our systems approach is built into every product. Delphi's flexible engineering approach encourages collaboration. And, Delphi has a thorough understanding of automotive markets around the world and a global network of resources.



Delphi Multec® GDi Multi-Hole Fuel Injector tip is designed for fuel deposit robustness.